

INDEX

ABSTINENCE

worksite vs. clinic-based program participants, factors, 483, 489-490

AGE FACTORS

cancer mortality, age-specific rates for white men and women, 229
chronic bronchitis in coal workers, effect with dust exposure and smoking, 299-300
lung function in asbestos workers, smokers vs. nonsmokers, 246-247
lung function in occupationally exposed workers, effect with smoking, 166-167
T lymphocyte changes in asbestos workers, with smoking, 267-269

AIRFLOW OBSTRUCTION

(See also LUNG FUNCTION; RESPIRATORY SYSTEM)

chronic effects of cotton dust exposure, 420, 422-423
chronic obstructive bronchitis symptom, 183
coal and silica dust exposure as risk factors, 330
coal miners, occupational relationship, 289
coal miners, smoking as factor, 14
coal workers, dust exposure effect in smokers vs. nonsmokers, 313
coal workers, small opacities in pneumoconioses, relationship, 295-296
coal workers, smokers vs. nonsmokers, 309
cotton workers, smoking as additive risk, 16
individual abnormalities, determination of occupational exposure vs. smoking effects, 168
nonspecific hyperreactivity following exposure to cotton dust, 427

AIRFLOW OBSTRUCTION—Contd.

occupationally exposed workers, patterns of injury in large and small airways, 150-151
silica-exposed workers, pathogenesis, 340
smokers, patterns of injury in large and small airways, 148-150

Amines See AROMATIC AMINES

ANIMAL STUDIES

(See also SMOKE INHALATION, ANIMAL)
carcinogenic effects of uranium ore dust exposure in dogs, 458
carcinogenicity of chemicals in cigarette smoke, effect with radiation, 459
carcinogenicity of cigarette smoke and asbestos, 232-234
industrial pollutants, interactions with tobacco smoke, recommended research, 391
lung function effects of radon daughters, uranium ore dust, cigarette smoke, 464
3-methylcholanthrene and crocidolite asbestos effects in hamster trachea, 234
polycyclic aromatic hydrocarbons and chrysotile asbestos effects in trachea of rats, 234
radiation and cigarette smoke in tumor formation, 456-460

ANTISMOKING MATERIALS

components of controlled worksite smoking modification programs, 486-488

INDEX

Antismoking campaigns *See* **PROGRAMS AND POLICIES; SMOKING CONTROL PROGRAMS; WORKPLACE INTERVENTION PROGRAMS**

AROMATIC AMINES

(*See also* **OCCUPATIONAL EXPOSURES**)

betanaphthylamine, carcinogenicity, 371-372

bladder cancer risk, interactive effects with smoking in exposed workers, 383

chemical carcinogenesis as species-specific phenomenon, 371

occupational exposure, disease risks, 359-392

workplace exposures in cancer risk, 370

AROMATIC HYDROCARBONS

(*See also* **BENZO[A]PYRENE**)

asbestos exposure and smoking, interactive effects on metabolism, 237-238

interactive effects with asbestos in animals, 234

lung cancer in exposed workers, relative risk, with smoking, 378

ASBESTOS

(*See also* **OCCUPATIONAL EXPOSURES**)

animal studies of carcinogenic interactions with cigarette smoke, 232-234

carcinogenesis in exposed workers who smoke, mechanisms, 228, 231

carcinogenesis role, tumor promoter vs. initiator, 236-237

carcinogenic risk, establishing dose and exposure levels, 217-219

chest x rays of exposed workers, lowest readings by highest readings, 261

chronic lung disease risk, effect with smoking, 239-266

commercial products, differences as factors in respiratory tract fiber disposition, 200-201

crackles and clubbing in exposed workers, independent effects of smoking, 156

ASBESTOS—Contd.

fibers as carriers of carcinogens in cigarette smoke, risk relationship, 238

health effects in chrysotile-exposed smokers vs. nonsmokers, 253

industrial exposure standards and environmental control, public health implications, 270

interstitial fibrosis in exposed populations, smoking relationship, 263-264, 266

intrapulmonary deposition and clearance, effect of chemicals in cigarette smoke, 236-237

low-dose environmental exposure as disease risk factor, 199-200

lung cancer and chronic lung disease, combined risks of exposure and smoking, 199

lung cancer in exposed workers, risk with smoking, 13-14, 378

lung cancer in exposed workers, sex ratio of observed vs. expected deaths, 214

lung cancer in exposed workers, smoking status in risk determination, 205, 210, 213, 216-220

lung cancer in workers, interactive effects of exposure level and smoking category, 219-220

lung cancer risk in exposed smokers vs. nonsmokers, summary and conclusions, 271

lung disease and cigarette smoking in exposed workers, 147

lung function changes in exposed workers, smokers vs. nonsmokers, 241, 243-254

lung injury risk determination, problems, 239-241

mortality, cohort study data by type of exposure, 202-204

observed vs. expected mortality in workers, 227-228

occupational exposure, public health implications, 9-10

principal varieties and structural features, 200-201

pulmonary fibrosis in dockyard workers, by smoking habit and exposure duration, 266

INDEX

ASBESTOS—Contd.

- reduction/cessation of exposure and smoking, effect on lung cancer risk, 224–228
- restrictive and obstructive lung injury in exposed workers, 151
- roentgenographic changes in exposed vs. nonexposed workers, smoking relationship, 259–260, 262
- small airways injury in exposed workers, smokers and non-smokers, 256–258
- tumors in rodents following exposure, with/without cigarette smoke components, 235

ASBESTOSIS

(*See also* OCCUPATIONAL DISEASES)

- prevalence in asbestos-exposed populations, smokers vs. non-smokers, 263, 265

BACTERIA

- endotoxins in cotton bract and byssinosis symptoms in cotton workers, relationship, 424–426

BENZO[A]PYRENE

(*See also* AROMATIC HYDROCARBONS)

- carcinogenic interaction with chrysotile asbestos in rats and hamsters, 234
- carcinogenicity in animals, interactive effect with radiation, 459

BIRTH COHORTS

- lung cancer mortality, occupation and smoking as factors, 102
- race- and sex-related changes in smoking habits, 38–53

BLADDER CANCER

(*See also* CANCER; OCCUPATIONAL DISEASES)

- betanaphthylamine and benzidine manufacturing workers, exposure duration as factor, 371
- chemical workers, relative risk, 380
- chemical workers, risk of naphthylamines and benzidine exposure, 370
- mortality in refinery and chemical workers, study data, 362–363

BLADDER CANCER—Contd.

- occupation and smoking, interactive effects, 378–385
- occupational groups at risk, smoking as factor, 383
- radiation and chemical exposures as risks, with smoking, 381
- relative risk for cigarette smoking, lifetime consumption as factor, 380
- sex ratio of risk, by smoking habit and occupation, 379–380
- truck drivers, diesel exhaust inhalation and smoking in risk, 385

BRAIN CANCER

- pesticide-exposed workers, possible risk relationship, 386–387

BRONCHI

(*See also* BRONCHIOLES; LUNGS)

- radiation and cigarette smoke, interactive effects, 463

BRONCHIAL CANCER

- uranium miners, influence of radiation exposure and smoking, 450

BRONCHIAL DISEASES

- simple and chronic bronchitis, symptoms, 299

BRONCHIOLES

(*See also* BRONCHI)

- inflammatory response and fibrosis, effect of smoking vs. asbestos exposure, 255–256
- silica-induced injury, 340

BRONCHITIS

(*See also* BRONCHIAL DISEASES; LUNG DISEASES; OCCUPATIONAL DISEASES; RESPIRATORY TRACT DISEASES)

- age-adjusted association with byssinosis, by smoking status and sex, 412
- age-adjusted association with smoking, by byssinosis status and sex, 411
- cement workers, dust exposure and smoking as independent risk factors, 187
- chronic simple and chronic obstructive bronchitis, symptoms, 183
- coal and silica dust-exposed workers, 330

BRONCHITIS—Contd.

- coal miners, dust exposure and smoking, risk determination, 184-185
- coke oven workers, exposure and smoking as factors, 191
- copper smelter workers, exposures and smoking as risk factors, 191
- cotton workers, agents responsible for inflammatory response, 424-427
- cotton workers, chronic exposure as factor, 429
- cotton workers, possible additive effect of dust exposure and smoking, 426
- cotton workers, smoking as factor, 410
- grain workers, dust exposure and smoking as risk factors, 187-189
- occupational exposure, pattern of development, 150
- occupational exposures and smoking risks, summary and conclusions, 191
- pattern of smoking-related development, 148
- silica-exposed miners and other workers, smokers vs. nonsmokers, 331-334
- simple and chronic bronchitis, symptoms, 299
- worksites chemicals or physical agents as cause of occupational bronchitis, 183

BYSSINOSIS

- (*See also* DUST; OCCUPATIONAL DISEASES; PNEUMOCONIOSIS)
- age-adjusted association with bronchitis, by smoking status and sex, 412
- age-adjusted association with smoking, by bronchitis status and sex, 412
- containment of cotton dust levels as factor in reduced risk, 431-432
- cotton dust exposure duration as factor, 410
- cotton textile workers, job category as factor in risk, 403

BYSSINOSIS—Contd.

- cotton textile workers, smoking influence on development, 16, 403-423
- cotton workers, correlation with endotoxins in airborne dust, 425
- cotton workers, definition of grades, 409-410
- cotton workers, prevalence by median dust level, smokers vs. nonsmokers, 414
- dust levels as factor in cotton workers, 16
- expiratory volume in cotton workers with/without disease, smokers vs. nonsmokers, 417
- prevalence and severity in cotton workers who smoke, dust exposure level as factor, 432
- prevalence data for nine exposure groups, 411
- textile mill workers, by grade, smoking status, and dust level, 413
- ventilatory deterioration risk in cotton workers with acute symptoms, 423

CANCER

- (*See also* CARCINOGENESIS; OCCUPATIONAL DISEASES)
- historical association with tobacco use, 6
- Japanese A-bomb survivors, relative risk in smokers vs. nonsmokers, 455
- leather industry workers, exposure as risk independent of smoking, 376
- mortality, age-specific rates for white men and women, 229
- mortality, age-standardized rates with/without asbestos exposure and smoking, 242
- mortality, confounding of occupational exposure effects by smoking, 114-122
- mortality in rubber workers, study data, 368-369
- mortality ratios in metal ore miners, smoking as factor, 343-344
- occupational exposure relationship, overview, 7

INDEX

CANCER—Contd.

- occupational exposures and smoking as causal factors, 374-388
- radiation and cigarette smoke induction in animals, 456-460
- radiation and smoking in risk, summary and conclusions, 465
- refinery and chemical workers, smoking and exposure as risk factors, 361, 364-366
- workers exposed to "pure" silica, standard mortality ratios, 344-345
- workplace and smoking, evaluation of interactions, 12
- workplace exposures and smoking as risk factors, 101

CARCINOGENESIS

(See also CANCER)

- animal studies of interactive effects of cigarette smoke and asbestos, 232-234
- animal studies of radiation and cigarette smoke effects, 456-460
- aromatic amines, pathway of biotransformation and urinary excretion efficiency, role, 371
- concepts of initiation and promotion, 234, 236-239
- enzymatic activity of pulmonary alveolar macrophages, role, 237-238
- hazardous occupational exposures and smoking, possible synergism, 8
- mechanisms in cigarette-smoking asbestos workers, 228, 231
- occupational exposures and smoking as initiators and promoters, 107-108

CARCINOGENS

- aromatic amines, regulation of workplace exposure, 370
- asbestos, problems in establishing carcinogenic dose and exposure levels, 217-219
- chemicals in cigarette smoke, interactive effects with radiation in animals, 459-460
- disposition and activation, effects of occupational exposure and smoking, 106-107

CARCINOGENS—Contd.

- lung cancer risk of known or suspected occupational exposure, with smoking, 377-378
- naphthylamines and benzidine, bladder cancer risk in exposed workers, 370
- silica, research recommendations, 347
- tobacco smoke at worksite, possible occupational carcinogen in non-smokers, 126
- workplace exposures, recommendations for control, 390-391

CELLS

- function and structure alterations by asbestos fibers, role in carcinogenesis, 236

CELLS, EPITHELIAL

- asbestos as promoter of transformation by carcinogens in cigarette smoke, 239

CESSATION OF SMOKING

(See also REDUCTION OF SMOKING; WORKPLACE INTERVENTION PROGRAMS)

- asbestos workers, effect on lung cancer risk, 224-225, 227-228
- asbestos workers, to alter future disease risk, 270-271
- biochemical verification in controlled worksite modification studies, 486-488
- blue-collar vs. white-collar workers, sex differences, 33
- blue-collar workers, workplace environment as factor, 10
- coal miners to reduce respiratory morbidity and mortality, 312-313
- controlled studies, data by worksite type, procedural characteristics, 484-485
- controlled studies, design and outcome data of smoking modification programs, 486-488
- cotton workers, effect on byssinosis symptoms, 414
- multiple risk factor intervention programs, efficacy for worksites, 500-502
- nicotine chewing gum as aid in worksite programs, 495

INDEX

CESSATION OF SMOKING—Contd.

- race, sex, and occupation as factors, 53–55
- uncontrolled studies, 481–482
- workplace program effects, evaluation criteria, 479–480
- workplace program participants, consumption level as factor in success, 490–491
- workplace program participants, controlled studies, 483, 489–490
- workplace program participants, efficacy of social support, physician's advice, 491–495
- workplace programs, recommendations to reduce occupational risks, 391

CESSATION OF SMOKING, METHODS

- (*See also* REDUCTION OF SMOKING; SMOKING CONTROL PROGRAMS; WORKPLACE INTERVENTION PROGRAMS)
- monetary incentives and competition in worksite programs, efficacy, 495–498
- physician's advice in worksite programs, efficacy, 493–495
- programs used in controlled worksite smoking modification studies, outcome data, 486–488

CHEMICALS

- (*See also* OCCUPATIONAL EXPOSURES)
- bladder cancer in exposed workers, risk factor with smoking, 384
- occupational exposure, bladder cancer risk, with smoking, 381–382

CHEST X RAY

- (*See also* HEALTH EXAMINATIONS)
- abnormal in patients with asbestos-induced interstitial fibrosis, 259
- abnormalities related to asbestos exposure vs. smoking, 259–260, 262
- asbestos workers, lowest readings by highest readings, ILO U/C scale, 261
- changes in non-asbestos-exposed workers, cigarette smoking relationship, 259–260, 262

CHEST X RAY—Contd.

- ILO classification system, variability of interpretation, 260
- lung injury from occupational exposures and smoking, efficacy for evaluation, 153–155
- occupationally exposed workers, effect of smoking, 154–155
- pneumoconiosis defined as roentgenographic changes produced by coal dust, 290

Chronic airflow obstruction *See* AIRFLOW OBSTRUCTION; RESPIRATORY SYSTEM

CHRONIC BRONCHITIS

- (*See also* BRONCHIAL DISEASES; BRONCHITIS; LUNG DISEASES; OCCUPATIONAL DISEASES)
- chrysotile asbestos workers, prevalence in smokers vs. nonsmokers, 253
- coal miners, dust exposure and smoking as factors, with age, 298–300
- coal miners, occupational relationship, 289
- occupational exposure and smoking, additive effect, 13, 15
- silica-exposed workers, dust exposure and smoking as factors, 330, 335
- silica-exposed workers, research recommendations, 347
- surveys of prevalence, 145–146

CHRONIC LUNG DISEASE

- (*See also* LUNG DISEASES; OCCUPATIONAL DISEASES)
- asbestos exposure and smoking, effects of combined exposure, 239–266
- etiology, occupational and lifestyle influences, 8
- mortality in asbestos workers, smoking as factor, 240–241
- occupational exposure relationship, overview, 7
- occupationally exposed workers, risk evaluation techniques, 142
- occupation-related and smoking-related, relative frequencies, 145

INDEX

CHRONIC LUNG DISEASE—Contd.
pneumoconioses, bronchitis, and
asthma, occupational exposure
risk relationship, 141
workplace and smoking, evaluation
of interactions, 12

CHRONIC OBSTRUCTIVE LUNG DISEASE

(*See also* CHRONIC LUNG DISEASE; LUNG DISEASES; OCCUPATIONAL DISEASES)
ICD addition 1967, effect on time
trends in respiratory disease
mortality, 143
mortality, occupation and smoking
as factors, 145

CIGARETTE SMOKE

(*See also* SMOKE INHALATION, ANIMAL)
animal studies of carcinogenic interactions with asbestos, 232–234
asbestos fibers as carriers of carcinogens, interactive effect, 238
carcinogenic interactions with asbestos, animal studies, 232–234
exposure measurement, importance in workplace studies, 161
impairment of mucociliary transport and function of phagocytic cells, 236–237
large airways, small airways, and parenchyma as sites of lung injury, 148–151
tumor induction in animals, radiation effect, 456–460
tumors in rodents following exposure to asbestos and smoke components, 235

COFFEE DRINKING

bladder cancer risk relationship, 380, 382

COMPENSATION CLAIMS

apportioning impairment between occupational causes and cigarette smoking, 170
coal workers, establishing independent effects to determine disease causes, 289

COST BENEFITS ANALYSIS

(*See also* STATISTICAL ANALYSIS)

COST BENEFITS ANALYSIS—Contd.
worksite smoking intervention/control programs, 477

COUGH

(*See also* RESPIRATORY SYMPTOMS)
rubber workers, duration of employment as factor, with smoking, 388–390

COUNSELING

physician's advice in smoking cessation programs, efficacy, 493–495

Demographic factors *See* OCCUPATIONAL GROUPS; OCCUPATIONS

DUST

(*See also* OCCUPATIONAL EXPOSURES)
cement, independent risk factor for bronchitis, with smoking, 187
coal dust exposure and bronchitis, risk relationship, 184–185
coal dust exposure as emphysema risk in miners, smoking role, 305–308
coal dust exposure, underground vs. surface workers, 290
coal, exposure area and duration as factors in pneumoconiosis, 294–295
cotton, bronchitis and byssinosis risk in exposed workers, with smoking, 16, 412–414
cotton, byssinosis in workers, by median dust level, smokers vs. nonsmokers, 414
cotton, chronic clinical effects of exposure, 420, 422–423
cotton, endotoxins in airborne dust in inflammatory lung injury, 424–426
cotton, hemp, and flax, industrial bronchitis and byssinosis in workers, 403
cotton, lung cancer and respiratory disease mortality in exposed workers, 429, 431
cotton, mechanisms of lung injury, 423–428
cotton, nonspecific hyperreactivity to exposure, 427–428

INDEX

DUST—Contd.

- cotton, standard maximum levels for occupational exposure, 414–415
- grain, bronchitis risk factor in exposed workers, with smoking, 187–188
- lung diseases in exposed workers, underreporting, 144
- ventilatory function effects in coal workers, with smoking, 308–312

EMPHYSEMA

- (*See also* CHRONIC LUNG DISEASE; OCCUPATIONAL DISEASES)
- coal workers, dust exposure and smoking in risk, 14, 304, 313
- cotton vs. noncotton workers, smokers vs. nonsmokers, 430
- cotton workers, smoking as causal factor, 16–17, 428–431, 433
- parenchymal injury caused by smoking, 149
- radon daughters, uranium ore dust, and cigarette smoke effects in dogs, 458
- surveys of prevalence, 145–146
- time trends in mortality, effect of changes in ICD categories, 143

ENZYME ACTIVITY

- biotransformation of industrial toxicants by smoke constituents, 391
- carcinogenesis, stimulation by asbestos, 236–237
- carcinogenicity of aromatic amines, role, 371
- silica-induced lung injury, relationship, 339–340

ENZYMES

- angiotensin-converting enzyme, 340

EX-SMOKERS

- (*See also* NONSMOKERS)
- occupational differences, 11

GASTROINTESTINAL CANCER

- synthetic fiber factory workers, interaction of exposure and smoking, 387–388

Health education *See* SMOKING CONTROL PROGRAMS; WORK-PLACE INTERVENTION PROGRAMS

HEALTH EXAMINATIONS

- chest x ray, efficacy for evaluating occupation and smoking risks, 153–155
- occupationally exposed workers, need for smoking information, 131
- physiological assessment, efficacy for evaluating occupation and smoking risks, 155–157
- respiratory symptoms history to evaluate occupation and smoking risks, 152–153

HEART DISEASES

- etiology, occupational and lifestyle influences, 8

IMMUNE SYSTEM

- alterations following combined exposure to cigarette smoke and asbestos, 266–270

IMMUNITY

- cellular, lymphocyte changes in asbestos workers, smoking habit correlation, 267–270
- humoral, immunoglobulins in asbestos-exposed workers vs. cigarette smokers, 266–267

IMMUNOGLOBULINS

- IgA and IgG levels in asbestos workers vs. cigarette smokers, 266–267

INCENTIVES

- monetary incentives and competition in smoking cessation, efficacy, 495–498

KIDNEY CANCER

- mortality in refinery and chemical workers, study data, 362–363
- occupations at possible risk, smoking as factor, 385–386

LARYNGEAL CANCER

- uranium miners, possible interaction of radiation and smoking, 463

LARYNX

- (*See also* RESPIRATORY SYSTEM)

INDEX

LARYNX—Contd.

- radiation and cigarette smoke, interactive effects, 463

LIVER CANCER

- occupational groups at risk, 387
- solvent-exposed workers, risk relationship, 387

LUNG CANCER

(See also BRONCHIAL NEOPLASMS; OCCUPATIONAL DISEASES)

- asbestos-exposed nonsmokers, risk determination, 210-213
- asbestos-exposed smokers, risk determination, 213, 216-220
- asbestos-exposed workers, sex ratio of observed vs. expected deaths, 214
- asbestos-exposed workers, smoking status in risk determination, 205, 210
- asbestos exposure, multiplicative risk in smokers, 13
- asbestos exposure risk in smokers vs. nonsmokers, summary and conclusions, 271
- asbestos workers, expected vs. observed mortality, by smoking habit, 215
- asbestos workers, interactive effects of exposure level and smoking category, 219-220
- blue-collar workers, odds ratio, 376-377
- Canadian fluorspar miners, risk with smoking, 453-454
- coal dust exposure and smoking in risk, 313
- coke oven workers, occupational exposure as factor, 391
- gold miners, risk in smokers vs. nonsmokers, 343
- histological types, positive association of smoking, 377
- historical association with cigarette smoking, 6
- hypothesis to reconcile discrepancies in epidemiological data, 461-463
- hypothetical distribution in smoking and nonsmoking uranium miners, U.S. white men, 457

LUNG CANCER—Contd.

- metal ore miners, smoking as risk factor, 343-344
- miners, interaction of smoking and cancer, study data, 447
- mortality, causal relationship with smoking, 101-104
- mortality in coal workers vs. general population, 301-304
- mortality in male asbestos workers, observed vs. expected weighted average probabilities, 233
- mortality in men, ratios by age, smoking characteristics, 105
- mortality in pesticide-exposed workers, 372-374
- mortality in refinery and chemical workers, study data, 362-363
- mortality in cotton workers, 429, 431
- occupational exposure and smoking risks, controlling for independent effects and interactions, 124-125
- occupational exposure relationship, smoking status as source of confounding, 115-122
- occupational exposure to known or suspected carcinogens, risk with smoking, 377-378
- occupational exposures and smoking, causal relationship, 376-378
- polonium 210 in cigarette smoke in carcinogenesis, with chemical constituents, 461
- race, sex, occupation, and birth cohort as factors, 39-40, 43
- radiation and smoking in epidemiology, studies on interactive effects, 455-456
- radiation-exposed miners, risk in smokers vs. nonsmokers, 446
- radon daughter exposure and smoking as risk factors, 17
- reduction/cessation of asbestos exposure and smoking, effect on risk, 224-228
- residential exposure as risk factor, research recommendations, 464
- silica-exposed workers, 341-348
- silicotics, proportional morbidity rate during followup, 345-346
- steel workers, risk ratios in smokers vs. nonsmokers, 344

LUNG CANCER—Contd.

- Swedish miners, radiation and smoking in risk, 452-453
- threshold of risk in asbestos workers, exposure level and smoking as factors, 220-224
- uranium miners, induction-latent period in smokers vs. nonsmokers, 451
- uranium miners, risk in smokers vs. nonsmokers, 449-452
- women, risk factors, 377

LUNG DISEASES

- (*See also* CHRONIC LUNG DISEASE; CHRONIC OBSTRUCTIVE LUNG DISEASE; OCCUPATIONAL DISEASES; PNEUMOCONIOSIS; PULMONARY FIBROSIS; RESPIRATORY TRACT DISEASES)
- hazardous occupational exposures and smoking, possible synergism, 8-9
 - individual relative risk determination, guidelines, 167-169
 - interstitial fibrosis in asbestos workers, 271
 - mortality, age-standardized rates with/without asbestos exposure and smoking, 242
 - mortality in asbestos-exposed workers, smoking status as factor, 201
 - obstructive and restrictive, role of asbestos exposure and smoking, 241, 243-254
 - occupational exposure and smoking effects, summary and conclusions, 169-170
 - occupational exposures and smoking, potential interactions, 159
 - pneumoconiosis, silicosis, chronic bronchitis in coal workers, 289
 - pneumonitis in uranium miners, radiation exposure as factor, 464
 - restriction and obstruction processes in occupationally exposed workers, 151
 - restrictive and obstructive in asbestos workers who smoke, 271
 - rubber workers, occupational exposures and smoking as factors, 388-390

LUNG DISEASES—Contd.

- silica-exposed copper miners, early study of risk relationship, 328
- statistical analysis of independent and interactive effects of smoking, 162-164
- survey populations, prevalence of cigarette smoking, 147

LUNG FUNCTION

(*See also* RESPIRATORY FUNCTION TESTS)

- asbestos exposure and smoking, additive effects, 14, 271
- asbestos exposure level as factor, 257
- asbestos workers, forced expiratory volume in smokers, ex-smokers, nonsmokers, 248
- asbestos workers, patterns of change in smokers vs. nonsmokers, 241, 243-254
- asbestos workers, predictive equation by smoking status, age, height, 247
- chrysotile asbestos workers, profile of smokers vs. nonsmokers, 253
- coal miners with irregular opacities, exposure, age, and smoking as factors, 297-298
- coal miners with rounded or regular opacities, 296
- coal workers, 304
- coal workers, dust exposure and smoking effects, 296-297, 306-307
- coal workers with pneumoconiosis, abnormalities, 295
- coding of lung function profile, 252
- cotton textile workers, dust exposure and smoking as factors, 16, 403, 415-419
- cotton workers, hyperreactivity to dust exposure as possible factor in decline, 428
- cotton workers, smoking as factor, 432
- cotton workers, type of dust and exposure level as factors, 419
- cotton workers with byssinosis and bronchitis, risk with smoking, 422-423

INDEX

LUNG FUNCTION—Contd.

- cotton workers with/without
 bronchitis or byssinosis, smokers
 vs. nonsmokers, 417
- expiratory flow and lung volume,
 asbestos dust exposure relation-
 ship, 249–250
- foundry workers exposed to silica,
 effects, 336
- occupational exposure effects,
 simultaneous contribution of ag-
 ing and smoking, 166–167
- physiological assessment in occupa-
 tionally exposed workers, smok-
 ing as factor, 157
- prospective study data on silica-ex-
 posed workers, 337–338
- restrictive vs. obstructive effect of
 asbestos exposure, smoking as
 factor, 248–252
- rubber workers, duration of em-
 ployment as factor, with smok-
 ing, 388–389
- silica-exposed miners and other
 workers, smokers vs. non-
 smokers, 331–334
- silica exposure vs. smoking effects,
 340–341
- uranium miners, ore dust, radia-
 tion, smoking effects, 463–464
- ventilatory function decline in
 smokers, 150

LUNG VOLUME

(See also RESPIRATORY FUNC-
TION TESTS)

- asbestos exposure effect in smokers
 and nonsmokers, 258
- asbestos workers, by dust index in
 nonsmokers vs. smokers, 244
- chronic obstructive vs. restrictive
 lung disease patients vs. normal
 individuals, 243
- coal workers, additive effects of
 dust exposure and smoking, 308
- coal workers with pneumoconiosis,
 295
- coal workers with/without bronchi-
 tis, smokers vs. nonsmokers,
 310–312
- dust exposure relationship, 249

LUNGS

(See also RESPIRATORY SYSTEM)

LUNGS—Contd.

- asbestos deposition and clearance,
 effect of chemicals in cigarette
 smoke, 236–237
- chronic inflammatory destruction
 in cotton workers, smoking fac-
 tor, 428–431
- coal workers, confounding of dust
 exposure effects by smoking,
 289–290
- cotton workers, agents responsible
 for inflammatory response, 424–
 427
- elastic recoil effects of asbestos ex-
 posure and smoking, differences,
 258
- emphysema, mucus glands, goblet
 cell metaplasia, pigmentation in
 smokers vs. nonsmokers, 430
- mechanisms of cotton dust-related
 injury, 423–428
- patterns of injury from asbestos ex-
 posure and smoking, risk deter-
 mination, 239
- patterns of injury from occupation-
 al exposures and smoking, 148–
 151
- silica-exposed workers, mechanisms
 of injury, 339–341
- small opacities in coal workers
 with pneumoconiosis, smoking ef-
 fect, 296

LYMPHOCYTES

- age and smoking as correlates of
 changes in asbestos workers,
 267–269

Mathematical models See STATIS- TICAL ANALYSIS

MESOTHELIOMA

- wives and children of asbestos
 workers, risk, 200

MODELING TECHNIQUES

(See also STATISTICAL ANALY-
SIS; WORKPLACE EXPOSURE
STUDIES)

- analyses to control potential con-
 founding of occupational expo-
 sure by smoking, 129–130

MORBIDITY

(See also OCCUPATIONAL DIS-
EASES; WORKPLACE EXPO-
SURE STUDIES)

INDEX

MORBIDITY—Contd.

- respiratory diseases, smoking as predominant cause, 142
- silica exposure effects, early studies, 328

MORTALITY

(See also OCCUPATIONAL DISEASES; WORKPLACE EXPOSURE STUDIES)

- asbestos-exposed persons, industrial standards and smoking cessation to reduce risk, 270
- asbestos-related, data from cohort studies, 202-204
- asbestos workers, observed vs. expected, 227-228
- asbestos workers, smoking as factor, 241
- bladder cancer in chemical workers, 370-371
- bronchial and lung cancer in men, by birth cohort and age at death, 230
- bronchial, tracheal, and lung cancer, age-specific rates, white men and women, 229
- cancer in rubber workers, 366-370
- cancer risk in certain occupations, 375-376
- chronic respiratory diseases in 1960, 1970, 1980, by ICD category, 143
- coal workers, cigarette smoking as major factor, 303-304
- lung cancer and chronic lung disease in asbestos workers, smoking as factor, 201
- lung cancer, causal relationship with smoking, 101-104
- lung cancer in asbestos-exposed workers, expected vs. observed, by smoking habit, 215
- lung cancer in asbestos-exposed workers, sex ratio of observed vs. expected, 214
- lung cancer in male asbestos workers, observed vs. expected weighted average probabilities, 233
- lung cancer in men, mortality ratios by age, smoking characteristics, 105

MORTALITY—Contd.

- lung cancer in Swedish miners, radiation and smoking as factors, 452-453
- lung cancer in U.S. uranium miners, smoking as factor, 446, 448-452
- metal ore miners, pneumoconiosis, tuberculosis, cancer risks, 342
- occupational exposure risk, smoking prevalence and age distribution as factors, 127-128
- occupationally related, potential confounding by smoking, 114-123
- pesticide-exposed workers, 372-374
- refinery and chemical workers, smoking and exposure in risk, 361-366
- respiratory disease and lung cancer in cotton workers, factors, 429, 431
- respiratory diseases in coal workers, 300-304
- respiratory diseases, smoking as predominant cause, 142
- respiratory diseases, underestimation with vital statistics, 144
- selected causes, age-standardized rates with/without asbestos exposure and smoking, 242
- time trends for respiratory diseases, effect of changes in disease classifications, 143
- tuberculosis and nonmalignant respiratory disease in silica-exposed workers, 327
- tuberculosis, silicosis and cancer in silicotics, smoking factor, 347
- workplace environment and cigarette smoking as factors, 11

MORTALITY RATIOS

- cancer and pneumoconiosis in metal ore miners, smoking as factor, 343-344
- cancer, confounding of occupational exposure effects by smoking, 114-118
- lung cancer in asbestos-exposed vs. control populations, smokers vs. nonsmokers, 216, 218
- occupation and smoking effect, control of potential confounding, 123

INDEX

MORTALITY RATIOS—Contd.
silicotics, age at diagnosis and
smoking as factors, 346–347

Motivation See **INCENTIVES**

NATIONAL HEALTH INTERVIEW SURVEYS

(See also **SMOKING SURVEYS**)

current smokers, 1978–1980, by sex
and occupation, 58–59

current smokers by sex and select-
ed occupations, 61–63

net change in smoking prevalence
by sex and occupation, 1970–
1980, 64–65

occupations by category and code,
57

percentage of population in select-
ed occupations, 1978–1980, 66–67

Neoplasms See **CANCER**

NONSMOKERS

(See also **EX-SMOKERS**)

asbestos workers, confirmation of
status to establish disease risk,
210–213

asbestos workers, exposure effects
on small airways function, 257

asbestosis prevalence, 264

lung cancer in asbestos-exposed
workers, risk determination,
210–213

occupationally exposed, comparison
group to control for potential
confounding by smoking, 124–126

Obstructive airway diseases See
**BRONCHIAL DISEASES; EM-
PHYSEMA; OCCUPATIONAL
DISEASES**

OCCUPATIONAL DISEASES

(See also **AIRFLOW OBSTRUC-**

**TION; ASBESTOSIS; BLADDER
CANCER; BRAIN CANCER;
BRONCHIAL CANCER;
BRONCHITIS; BYSSINOSIS;
CANCER; CHRONIC BRONCHI-
TIS; CHRONIC LUNG DISEASE;
CHRONIC OBSTRUCTIVE
LUNG DISEASE; EMPHYSEMA;
KIDNEY CANCER; LARYN-
GEAL CANCER; LIVER CAN-
CER; LUNG CANCER; LUNG
DISEASES; PANCREATIC CAN-**

OCCUPATIONAL DISEASES—Contd.
**CER; PNEUMOCONIOSIS; RES-
PIRATORY TRACT DISEASES;
SILICOSIS; TUBERCULOSIS)**

acute and chronic respiratory ef-
fects of exposure in cotton work-
ers, 420, 422–423

airways inflammation and restric-
tion in cotton workers, causes,
424–428

asbestosis in exposed populations,
smokers vs. nonsmokers, 263–264

bladder cancer in chemical work-
ers, exposures and smoking as
factors, 378–384

bladder cancer in dye, petroleum,
and plastic industries, smoking
factor, 383

bladder cancer in truck drivers,
smoking factor, 385

bladder cancer in workers exposed
to benzidine and betanaphthyla-
mine, smoking factor, 383

bladder cancer in workers exposed
to radiation, 381

bronchitis in cement workers, dust
exposure and smoking as factors,
186

bronchitis in coal miners, dust and
smoking as factors, 185

bronchitis in copper smelter work-
ers, smoking as factor, 191

bronchitis in gold miners, silica ex-
posure and smoking as factors,
185–186

bronchitis in grain workers, dust
and smoking as factors, 187–189

bronchitis in welders, additive ef-
fect of smoking, 190

byssinosis in cotton textile workers,
prevalence of smoking, 147

byssinosis in cotton textile workers,
smoking as factor, 16, 403–423

cancer, causal relationship of occu-
pational exposures and smoking,
374–388

cancer, evaluation of smoking and
workplace interactions, 12

cancer in pesticide-exposed workers,
smoking role, 372–374

chronic bronchitis and chronic air-
ways obstruction in silica-ex-
posed workers, smoking as fac-
tor, 15

INDEX

OCCUPATIONAL DISEASES—Contd.

- chronic bronchitis in grain workers, prevalence of smoking, 147
- chronic bronchitis, smoking and workplace interactions, 13
- chronic lung disease, evaluation of smoking and workplace interactions, 12-13
- development and organization of 1985 Report, 5
- emphysema in coal workers, dust exposure and smoking as factors, 305-308
- historical perspective, 6
- interstitial fibrosis in asbestos-exposed populations, 263, 265-266
- large bowel cancer in synthetic fiber factory workers, smoking effect, 387-388
- liver cancer in farm laborers, risk relationship, 387
- liver cancer in solvent-exposed workers, 387
- lung cancer and chronic lung disease in asbestos workers, smoking factor, 201
- lung cancer and respiratory disease mortality in cotton workers, 429, 431
- lung cancer in asbestos-exposed nonsmokers, risk determination, 210-213
- lung cancer in asbestos-exposed smokers, risk determination, 213, 216-220
- lung cancer in asbestos workers, interactive effects with smoking, 219-220
- lung cancer in asbestos workers, sex ratio of observed vs. expected deaths, 214
- lung cancer in asbestos workers, smoking status in risk determination, 205, 210
- lung cancer in coke oven workers, exposure risk, 391
- lung cancer in miners, induction-latent period in smokers vs. nonsmokers, 451
- lung cancer in miners, interactive effect of smoking, study data, 447-448

OCCUPATIONAL DISEASES—Contd.

- lung cancer in radiation-exposed miners, smokers vs. nonsmokers, 446
- lung cancer in Swedish miners, radiation and smoking as risk factors, 452-453
- lung cancer in uranium miners, risk in smokers vs. nonsmokers, 449-452
- lung cancer mortality ratios for asbestos workers, smokers vs. nonsmokers, 216, 218
- lung disease in coal miners, prevalence of smoking, 147
- lung disease mortality in asbestos workers by exposure type, 202-204
- pneumoconiosis, silicosis, chronic bronchitis in coal workers, 289
- pulmonary fibrosis in dockyard workers, by smoking habit and asbestos exposure, 266
- respiratory, mortality in coal workers, 300-304
- silica-induced, epidemiology, 327-330, 335-336
- simple and complicated pneumoconiosis in coal miners, radiologic characteristics, 290, 294

OCCUPATIONAL EXPOSURE STANDARDS

- asbestos, for reduction of interstitial fibrosis in workers, 270
- coal dust, prevention/reduction of pneumoconiosis, 295
- cotton dust, development of maximum exposure levels, 414-415

OCCUPATIONAL EXPOSURES

- (See also AROMATIC AMINES; AROMATIC HYDROCARBONS; ASBESTOS; CHEMICALS; DUST; PESTICIDES; PETROCHEMICALS; RADIATION; SILICA)
- asbestos, chronic lung disease risk, effect with smoking, 239-266
- asbestos, disease risks in exposed workers, smoking status as factor, 201, 205
- asbestos, duration effect on fibrosis, additive risk in smokers, 264, 266

INDEX

OCCUPATIONAL EXPOSURES—

Contd.

- asbestos, establishing risk threshold, smoking as factor, 223–224
- asbestos, mechanisms of carcinogenesis in workers who smoke, 228, 231
- asbestos, observed vs. expected mortality by years since initial exposure, 228
- asbestos, public health implications, 9
- asbestos, reduction/cessation of exposure and smoking, effects, 224–228
- asbestos, relative risk of lung cancer, with smoking, 378
- benzidine and betanaphthylamine, bladder cancer risk, with smoking, 383–384
- biological interactions with smoking, 104, 106–109
- cancer risk relationship, with smoking, 101
- carcinogens, recommendations for control, 390–391
- causal relationship with specific diseases, with smoking, 374–390
- cement dust and smoking, independent risk factors for bronchitis, 187
- chemicals, bladder cancer risk, with smoking, 381–382
- chronic disease epidemiology, factor with smoking, 8
- chronic lung disease risk relationship, 141
- coal dust, bronchitis risk factor with smoking, 185
- coal dust, control to reduce pneumoconiosis prevalence, 312–313
- coal dust, disease risk, with smoking, 298–299
- coal dust in miners, emphysema risk, smoking role, 305–308
- combustion effluents, inhalation and smoking as bladder cancer risk factors, 384
- control of smoking and exposure levels to reduce disease risk, 11
- cotton dust, acute effect on respiratory symptoms, with smoking, 409–410, 412–415

OCCUPATIONAL EXPOSURES—Contd.

- cotton dust, byssinosis and bronchitis risk in workers who smoke, 16
- cotton dust, chronic clinical effects, 420, 422–423
- cotton dust, expiratory volume in smokers vs. nonsmokers with/without disease, 417
- cotton dust, exposure level and smoking in bronchitis and byssinosis risk, 412–413
- cotton dust, job category as factor in byssinosis risk, 403
- cotton dust, respiratory disease and lung cancer mortality in exposed workers, 429, 431
- cotton dust, smoking influence on byssinosis development, 403–423
- cotton dust, type and exposure level as factor in lung function effects, 419
- lung disease relationship, evaluation methods, 151–157
- lung disease risk, with smoking, summary and conclusions, 169–170
- lung function effects, simultaneous contribution of aging and smoking, 166–167
- lung injury patterns, comparison with smoking-related injury, 148–151
- pesticides, mortality in exposed workers, 372–374
- petrochemicals, aromatic amines, pesticides, risks with smoking, 15, 359–392
- petrochemicals, bladder cancer risk, tobacco use as factor, 382
- polycyclic aromatic hydrocarbons, relative risk of lung cancer, with smoking, 378
- polyvinyl chloride and vinyl chloride, bronchitis risk relationship, 189
- "pure" silica, cancer risks, 344–345
- radiation, bladder cancer risk, with smoking, 381
- radiation in miners, lung cancer risk, 446
- rubber processing, lung function effects, 388–390

OCCUPATIONAL EXPOSURES—

Contd.

- silica, chronic bronchitis symptoms in exposed workers, smoking interactions, 185-186
- silica, disease risk with smoking, 15, 323-348
- silica exposure in uranium miners, risks with smoking, 463-464
- silica, importance of "free" vs. "combined" forms in occupational toxicity, 323
- silica, lung cancer risk relationship, 341-348
- silica, lung function and respiratory diseases in smokers vs. nonsmokers, 330, 335
- silica, noncompliance with permissible exposure limit, 323
- silica, population at risk, NIOSH survey, 323-324
- silica, prospective study data on exposed workers, 337-338
- silica, research recommendations, 347-348
- silica, respiratory disease risk, role of smoking, 325
- silica, smoking characteristics of exposed workers, 326
- silica, summary and conclusions about disease risk, 348
- solvents, risk of liver cancer in exposed workers, 387
- statistical interactions with smoking effects, 104, 109-113
- uranium ore dust, lung cancer risk in miners, 446-452, 457

OCCUPATIONAL GROUPS

(See also OCCUPATIONS)

- blue-collar workers, birth cohort, occupation, sex as factors in smoking, 38-55
- blue-collar workers, efficacy of smoking intervention programs, 499
- blue-collar workers, smoking prevalence by age and sex, 23-26
- blue-collar workers, workplace environment as factor in smoking behavior, 10
- clerical and kindred occupations, female smoking by birth cohort, 74

OCCUPATIONAL GROUPS—Contd.

- clerical and kindred workers, current smoking by sex, 58-59, 61, 64
- cotton, hemp, and flax workers, health effects of dust exposure, 403
- craftsmen and kindred workers, current smoking by sex, 58-59, 62, 64
- craftsmen or kindred occupations, male smoking by birth cohort, 71
- farm workers, current smoking by sex, 58-59, 62, 65
- laborers, except farm, current smoking by sex, 58-59, 62
- managers and administrators, current smoking by sex, 58-59, 61, 64
- managers and administrators, male smoking by birth cohort, 70
- managers and salesmen, relative risk of bladder cancer, 381
- miners, disease risk of silica exposure in smokers vs. nonsmokers, 331-334
- operatives and kindred occupations, male smoking by birth cohort, 72
- operatives and kindred workers, current smoking by sex, 58-59, 62, 64
- operatives, except transport, current smoking by sex, 62, 64
- professional, technical, and kindred occupations, female smoking by birth cohort, 73
- professional, technical, and kindred occupations, male smoking by birth cohort, 69
- professional, technical, and kindred workers, current smoking by sex, 58-59, 61, 64
- sales workers, current smoking by sex, 58-59, 61, 64
- service workers, current smoking by sex, 58-59, 63, 65
- transport operatives, current smoking by sex, 62, 64
- transport, service, manufacturing, construction workers, lung cancer risk, 375

INDEX

OCCUPATIONAL GROUPS—Contd.

- white-collar workers, birth cohort, occupation, sex as factors in smoking, 38–55
- white-collar workers, smoking prevalence by age and sex, 23–25
- workers at high risk, three approaches for smoking intervention, 498–500

OCCUPATIONAL LUNG DISEASES

(See also LUNG DISEASES; OCCUPATIONAL DISEASES)

- occupational bronchitis, worksite chemicals or physical agents in risk, 183
- prevalence not comprehensively documented, 146
- underestimation of affected workers, 144–146

OCCUPATIONS

(See also OCCUPATIONAL GROUPS)

- aides, smoking habits by age, 83
- architects, smoking habits by age, 83
- asbestos workers, 9, 13–14, 219–220
- asbestos workers, cancer mortality risk, 375
- asbestos workers, smoking intervention program efficacy, 499–500
- assemblers, smoking habits by age and sex, 83
- automotive workers, smoking habits by age and sex, 84
- banking, smoking habits by age and sex, 84
- barbers/beauticians, smoking habits by age and sex, 84
- bookkeepers, smoking habits by age and sex, 84
- Canadian fluorspar miners, lung cancer risk, with smoking, 453–454
- cement workers, 187
- chemical workers, cancer risk, 375–376
- chemical workers, relative risk of bladder cancer, 380
- civil service workers, smoking habits by age and sex, 85
- clergy, smoking habits by age and sex, 85

OCCUPATIONS—Contd.

- coal workers, 14, 289
- coal workers, smoking habits, 291
- coke oven workers, 191
- coke oven workers, lung cancer risk, 391
- construction workers, smoking habits by age, 85
- copper miners, silica-induced lung injuries, 328
- copper smelter workers, 191
- cotton textile mill workers, 147
- cotton textile workers, smoking influence on byssinosis development, 403–423
- cotton workers, byssinosis, bronchitis, smoking effects on lung function, 418–419
- cotton workers, exposure effects on lung function, with smoking, 415–419
- cotton workers, smoking habits, 404, 409
- cotton workers, study data on smoking prevalence, 405–408
- data entry operators, smoking habits by age, 85
- dentists, smoking habits by age and sex, 86
- disabled, smoking habits by age and sex, 86
- dockyard workers, 266
- doctors, smoking habits by age and sex, 86
- education, smoking habits by age and sex, 86
- electricians, smoking habits by age and sex, 87
- engineers, smoking habits by age and sex, 87
- executives, smoking habits by age and sex, 87
- factory workers, smoking habits by age and sex, 87
- farm laborers, liver cancer risk, 387
- farm workers, 147
- farmers, smoking habits by age and sex, 88
- firefighters, smoking habits by age, 88
- food preparation workers, smoking habits by age and sex, 88
- foremen, smoking habits by age, 88

INDEX

OCCUPATIONS—Contd.

foundry workers exposed to silica,
lung function effects, 335-336
gold miners, 186
gold miners, cancer risk, 342-343
grain workers, 147
granite shed workers, 147
granite workers exposed to silica,
lung function effects, 336
heavy equipment operators, smoking
habits by age, 89
hospital workers, smoking habits
by age and sex, 89
housewives, smoking habits by age,
89
law enforcement workers, smoking
habits by age, 89
lawyers, smoking habits by age
and sex, 90
leather industry workers, cancer
risk independent of smoking, 376
leather workers, bladder cancer
risk, 379-380
machine operators, smoking habits
by age and sex, 90
maids, smoking habits by age and
sex, 90
maintenance workers, smoking hab-
its by age and sex, 90
managers, smoking habits by age
and sex, 91
metal ore miners, respiratory can-
cer risk, 342
military personnel, smoking habits
by age, 91
miners, smoking habits by age, 91
nursing personnel, smoking habits
by age, 91
office workers, smoking habits by
age and sex, 92
painters, smoking habits by age, 92
pesticide-exposed workers, risks,
359-360, 372-374
pesticide workers, cancer risks,
372-374
petrochemical workers, bladder can-
cer risk, 382
pharmacists, smoking habits by age
and sex, 92
photo and printing workers, smok-
ing habits by age, 92
plumbers, smoking habits by age,
93

OCCUPATIONS—Contd.

polyvinyl chloride and vinyl chlo-
ride workers, 189
postal service workers, smoking
habits by age and sex, 93
pottery workers, silicosis preva-
lence, 328
printers, smoking habits by age
and sex, 93
railroad workers, smoking habits
by age, 93
real estate workers, smoking habits
by age and sex, 94
refinery and chemical workers ex-
posed to petrochemicals, risks,
359-392
refinery and chemical workers,
smoking and exposure in mortal-
ity risk, 361-366
rubber curing workers, 191
rubber workers, bladder cancer
risk, 379-380
rubber workers exposed to aromat-
ic amines, risks, 359, 366-370
sales people, smoking habits by age
and sex, 94
shipyard workers, lung cancer risk,
375
silica-exposed workers, risks, 15,
323-347
social workers, smoking habits by
age and sex, 94
steel mill workers, smoking habits
by age, 94
steel workers, lung cancer risk, 344
Swedish miners, lung cancer risk
in smokers vs. nonsmokers, 452-
453
technicians, smoking habits by age
and sex, 95
telephone operators, smoking habits
by age, 95
textile and garment industry work-
ers exposed to aromatic amines,
risks, 359, 370-372
textile workers, smoking habits by
age and sex, 95
truck drivers, bladder cancer risk,
385
truck drivers, lung cancer risk, 375
truck drivers, smoking habits by
age and sex, 95
unemployed workers, smoking hab-
its by age and sex, 96

INDEX

OCCUPATIONS—Contd.

- uranium miners, 147
- uranium miners, pulmonary effects of exposure and smoking, 463–464
- uranium miners, radiation and smoking in lung cancer risk, 446–452
- uranium miners, smoking habits, 448
- waiters/waitresses, smoking habits by age, 96
- welders, 189
- welders, smoking habits by age, 96
- woodworkers, smoking habits by age, 96

PANCREATIC CANCER

- daily cigarette consumption as factor in risk, 387

PASSIVE SMOKING

- lung cancer risk, with radon daughter exposure, research recommendations, 464
- occupational hazards, possible confounding of risk in nonsmokers, 126

PESTICIDES

- (*See also* OCCUPATIONAL EXPOSURES)
- brain neoplasms in exposed workers, possible risk relationship, 386–387
- mortality in exposed workers, 372–374
- occupational exposure, disease risks, 359–392

PETROCHEMICALS

- (*See also* OCCUPATIONAL EXPOSURES)
- mortality in exposed workers, 361–366
- occupational exposure, disease risks, 359–392

PNEUMOCONIOSIS

- (*See also* OCCUPATIONAL DISEASES)
- coal workers, historical association, 289
- coal workers, pattern of development, 151

PNEUMOCONIOSIS—Contd.

- coal workers pneumoconiosis and progressive massive fibrosis, prevalence, 294–295
- coal workers, standard mortality ratios vs. general population, 300–301
- disability payments vs. estimated prevalence, 146
- disease definition, 290
- dust exposure as major etiologic factor in coal workers, 312–313
- mortality ratios vs. cancer in metal ore miners, smoking as factor, 343–344
- silica-exposed miners and other workers, 331–334

Prevention of smoking *See* PROGRAMS AND POLICIES; SMOKING CONTROL PROGRAMS; WORKPLACE INTERVENTION PROGRAMS

PROGRAMS AND POLICIES

- (*See also* SMOKING CONTROL PROGRAMS; WORKPLACE EXPOSURE STUDIES; WORKPLACE INTERVENTION PROGRAMS)
- economic advantages/disadvantages of worksite programs, 477–479
- Johns Manville antismoking policy, cessation program, 499–500
- worksite smoking control programs, 477–510

PULMONARY FIBROSIS

- (*See also* LUNG DISEASES; OCCUPATIONAL DISEASES)
- animals exposed to cigarette smoke and asbestos, 234
- asbestos-exposed populations, smoking relationship, 263–264, 266
- asbestos exposure as risk factor, 14, 239–240
- asbestos-induced, abnormal chest x ray as indicator, 259
- dockyard workers, by smoking habit and asbestos exposure, 266
- fibrosing alveolitis in silica-exposed workers, smoking role, 325
- nonexposed vs. exposed asbestos workers, smoking relationship, 259–260, 262

INDEX

PULMONARY FIBROSIS—Contd.
silica exposure as factor, enzyme activity in pathogenesis, 339
uranium miners, exposure effects, with smoking, 463–464

Pulmonary function *See* **LUNG FUNCTION**

PULMONARY MACROPHAGES
enzymatic activity, influence in carcinogenesis, 237–238
silica cytotoxicity in pathogenesis of fibrosis, 339
small airways of smokers, pattern of lung injury, 148–149

RACE FACTORS
black blue-collar workers, smoking rates, 11
smoking prevalence, birth cohort, sex, occupation as factors, 42–46, 48–55

RADIATION
(*See also* **OCCUPATIONAL EXPOSURES**)
bladder cancer risk, with smoking, 381
bronchial cancer risk in uranium miners, with smoking, 450
cancer risk, with smoking, summary and conclusions, 465
human exposure levels from radon daughters, 445–446
Japanese A-bomb survivors, cancer risk in smokers vs. nonsmokers, 455
lung cancer epidemiology, studies on interactive effects with smoking, 455–456
lung cancer in Swedish miners, risk factor with smoking, 452–453
polonium 210 from tobacco smoke as cancer risk, 460–461
pulmonary effects in uranium miners, with smoking, 463–464
radon daughters, interactive effects with cigarette smoke exposure, 17
residential exposure, lung cancer risk with smoking, 454

REDUCTION OF SMOKING
(*See also* **CESSATION OF SMOKING; SMOKING CONTROL**)

REDUCTION OF SMOKING—Contd.
PROGRAMS; WORKPLACE INTERVENTION PROGRAMS)
biochemical verification in controlled worksite modification studies, 486–488
birth cohorts, by race, sex, and occupation, 41–52
controlled studies, data by worksite type, procedural characteristics, 484–485
controlled studies, design and outcome data of smoking modification programs, 486–488
worksite participants, controlled studies, 483, 489–490
worksite program effects, evaluation criteria, 479–480
worksite program participants, long-term effects, 491

RESEARCH RECOMMENDATIONS
(*See also* **WORKPLACE EXPOSURE STUDIES**)
animal studies of health effects of tobacco smoke and industrial pollutants, 391
cancer risk with occupational exposure and smoking, 12
chronic lung disease risk with occupational exposure and smoking, 12–13
health effects of occupational exposures and smoking, epidemiologic studies, 391
industrial pollutants, identifying constituents as cancer initiators/promoters, 391
lung cancer risk in occupationally exposed workers, 464
lung function effects in occupationally exposed smokers, 169
lung impairment, apportioning risk between occupational exposure and smoking, 170
methodology and evaluation issues in worksite smoking modification, 507–509
occupational exposure to specific agents, interactive effects with smoking, 169
occupational exposures, 347–348
passive smoking risks, 464

INDEX

RESEARCH RECOMMENDATIONS

Contd.

- statistical analysis of occupational exposure and smoking interactions, 169
- workplace smoking intervention programs, 17, 507-509

RESPIRATORY FUNCTION TESTS

(See also LUNG FUNCTION)

- asbestos workers and smokers, patterns of lung function changes, 241, 243-254
- chrysotile asbestos workers, percentage decline in smokers vs. nonsmokers, 253
- coal miners, 296-297, 311-312
- coal workers, dust exposure and smoking effects, 308-312
- coal workers, face workers vs. surface workers, 309
- cotton dust exposure and smoking, effects, 415-419
- expiratory volume in cotton workers, smokers vs. nonsmokers, 416-418
- expiratory volume in men, byssinosis, bronchitis, and smoking effects, 418
- expiratory volume in women, byssinosis, bronchitis, and smoking effects, 419
- flow rates in asbestos workers, by dust index in smokers vs. nonsmokers, 245
- rubber workers, duration of employment as factor, 388
- silica-exposed foundry workers, 336
- ventilatory capacity in coal workers, 304

RESPIRATORY SYMPTOMS

(See also COUGH)

- chronic cough and phlegm in coal miners, smoking as factor, 14, 313
- coal dust exposure relationship, 298-300
- cotton dust exposure and smoking, acute effects, 409-410, 412-415
- cough and phlegm in rubber curing workers, smoking as factor, 191
- rubber processing workers, duration of employment as factor, 388-389

RESPIRATORY SYMPTOMS—Contd.

- silica-exposed workers, chronic bronchitis risk factor with smoking, 186
- silica-exposed workers, dust exposure and smoking as factors, 330, 335
- standardized questionnaire to evaluate occupation and smoking effects, efficacy, 152-153
- workplace exposures in nonsmokers, occupational bronchitis criteria, 184

RESPIRATORY SYSTEM

(See also BRONCHI; BRONCHIOLES; LARYNX; LUNGS)

- airflow obstruction as symptom of chronic obstructive bronchitis, 183
- occupationally exposed workers, patterns of injury, 151
- pulmonary responses to silica exposure, smoking as factor, 325
- radiation and cigarette smoke, interactive effects, 463-464
- smokers, patterns of injury in large and small airways and parenchyma, 148-151
- ventilatory function in coal workers, dust exposure and smoking effects, 308-312

RESPIRATORY TRACT DISEASES

(See also BRONCHIAL DISEASES; EMPHYSEMA; LUNG DISEASES; OCCUPATIONAL DISEASES)

- coal miners, dust exposure and smoking as factors, 14-15
- historical association with coal mining, 289
- morbidity and mortality, smoking as predominant cause, 142
- mortality from nonmalignant diseases in silica-exposed workers, 327
- mortality in coal workers, 300-304
- mortality in cotton workers, 429, 431
- mortality in refinery and chemical workers, study data, 362-363
- mortality, underestimation with vital statistics, 144

INDEX

RESPIRATORY TRACT DISEASES

Contd.

- silica-induced, dust concentration and exposure duration in risk, 328-329
- silica-related, physical factors of occupational exposure, 325
- ventilatory disability in coal workers, cessation of smoking for reduction, 313

RISK THRESHOLD

- asbestos exposure, confounding by cigarette smoking as source of bias, 222
- lung cancer in asbestos workers, smoking as source of bias, 222-224

RISK REDUCTION

- lung cancer, cessation of asbestos exposure effect, 225-228
- respiratory disease in coal miners, dust control and smoking cessation, 312-313

SEX RATIO

- (*See also* OCCUPATIONAL GROUPS; OCCUPATIONS; SMOKING HABIT; WOMEN)
- bladder cancer risk, by smoking habit and occupation, 379-380
- changes in smoking prevalence for selected occupations, 64-65
- cotton workers, smoking habits, 404
- current smokers by sex, occupation, amount smoked, 58-63
- daily cigarette consumption by age and occupation, 27-31
- employment patterns and smoking prevalence, 23-26
- General Electric Company employees, smoking status by occupational category and age, 78-81
- lung cancer in asbestos-exposed workers, observed vs. expected deaths, 214
- occupation and smoking behavior, current estimates and trends, 11
- occupational categories, smoking habits by age, 83-96
- selected occupations, 66-68

SILICA

- (*See also* OCCUPATIONAL EXPOSURES)

SILICA—Contd.

- cancer risk in exposed workers, 341-348
- definitions of health effects, 325
- disease risk in exposed smokers vs. nonsmokers, 331-334
- disease risk in exposed workers, summary and conclusions, 348
- epidemiological findings among exposed workers, 327-330, 335-336
- "free" vs. "combined" forms, importance to occupational toxicity, 323
- industries with significant silica or mixed dust exposures, 323
- pathogenesis of related health effects, 339-341
- population at risk for exposure, NIOSH survey, 323-324
- prospective study data on exposed workers, 337-338
- pulmonary effects in uranium miners, with radiation and smoking, 463-464
- research recommendations on health effects, with other exposures and smoking, 347-348

SILICOSIS

- (*See also* OCCUPATIONAL DISEASES; PNEUMOCONIOSIS)
- coal miners, occupational relationship, 289
- dust concentration and exposure duration, risk relationship, 329
- dust exposure as risk factor, smoking role, 325
- lung cancer in patients, 341-342
- lung cancer proportional morbidity rate in followup of silicotics, 345-346
- lung injury mechanisms in exposed workers, 339-341
- pottery workers, early studies of risk relationship, 328
- workers exposed to "pure" silica, standard mortality ratios, 345

SKIN CANCER

- radiation and cigarette smoke condensate in induction in animals, 456-458

SMALL AIRWAYS

- (*See also* RESPIRATORY SYSTEM)

INDEX

SMALL AIRWAYS—Contd.

- abnormalities in chronic obstructive lung disease, 255
- asbestos exposure and smoking, effects, 271
- changes in smokers, consumption and duration of habit as factors, 255
- dysfunction in asbestos workers, differences in exposure and smoking effects, 258
- pattern of injury in asbestos-exposed workers, 256

SMALL AIRWAYS DISEASE

- (*See also* OCCUPATIONAL DISEASES; RESPIRATORY TRACT DISEASES)
- silica-exposed workers, research recommendations, 347

SMOKE INHALATION, ANIMAL

- emphysema induction in dogs, with radon daughters and uranium ore dust, 458
- lung cancer induction in rats, with radon daughter exposure, 458

SMOKING

- (*See also* WORKPLACE SMOKING)
- statistical analysis of independent and interactive effects with occupational exposures, 162-164
- synergistic vs. additive effect with occupational exposures, 360-361
- workplace, environment as factor in initiation, 32

SMOKING CONTROL PROGRAMS

- (*See also* WORKPLACE INTERVENTION PROGRAMS)
- clinic-based vs. worksite programs, validity of comparisons, 489
- design and outcome of controlled worksite smoking modification studies, 486-488
- organizational characteristics, other factors in program success, 502-504
- primary objectives of worksite smoking modification programs, 508-509
- recruitment strategies of various worksite programs, participation/attrition rates, 484-485

SMOKING CONTROL PROGRAMS—Contd.

- silica-exposed populations to reduce disease risk, 348
- social support, physician's advice, nicotine gum, incentives, efficacy, 491-498
- worksite, evaluation criteria, 479-480
- worksite, implementation, 504-506
- worksite, overview of advantages vs. disadvantages, 477-479
- worksite programs to modify smoking, three approaches, 503-504
- worksite, review of uncontrolled vs. controlled studies, 481-483, 489-490

SMOKING HABIT

- (*See also* OCCUPATIONAL GROUPS; OCCUPATIONS; SMOKING PREVALENCE; WORKPLACE SMOKING)
- asbestos-exposed workers, multiplicative interactive effects, 9
- asbestos workers, controlling for differences to reduce confounding, 219
- asbestos workers, synergistic effect on chronic lung disease mortality, 240-241
- birth cohorts, race- and sex-related changes in prevalence, 38-53
- blue-collar vs. white-collar workers, by sex and age, 23-26
- blue-collar vs. white-collar workers, initiation by age and sex, 29-32
- coal miners, chronic simple bronchitis risk factor, with occupational exposure, 185
- coal miners, study data on smoking characteristics, 291-293
- cotton dust-exposed workers, 404, 409
- cotton workers, disease risks, 16-17
- General Electric Company employees 1985, by occupational category, age, sex, 78-81
- gold miners, effect with silica exposure on bronchitis symptoms, 186
- male birth cohorts 1900-1978, changes in prevalence, 231
- Navajos in U.S. uranium miner study group, 448, 451

INDEX

SMOKING HABIT—Contd.

- pancreatic cancer patients, daily consumption as factor, 387
- white U.S. uranium miners vs. nonminer men, 448

SMOKING PREVALENCE

- (*See also* OCCUPATIONAL GROUPS; OCCUPATIONS; SMOKING HABIT; WORK-PLACE SMOKING)
- asbestos-exposed workers, study data, 206–209
- blue-collar vs. white-collar workers, 11
- coal miners vs. U.S. male population, 290
- coal workers, 291
- cotton workers, study data, 405–408
- male birth cohorts 1900–1978, 230
- radiation-exposed miners, 446
- uranium miners, 448

SMOKING SURVEYS

- American Cancer Society, by occupation, sex, age, 82–96
- coal miners, prevalence data, 291–293
- daily cigarette consumption by occupation for men and women, 27–31
- General Electric Company employees 1985, by sex, age, amount smoked, 78–81
- National Health Interview Surveys, employment patterns and smoking prevalence, 23–26
- National Health Interview Surveys for 1978–1980, by sex and occupation, 58
- National Health Interview Surveys, occupations by category and code, 57
- petrochemical, aromatic amine, and pesticide industries, prevalence, 360
- silica-exposed workers, study data, 325–326

SOCIOECONOMIC STATUS

- bladder cancer risk relationship, 381–382

STATISTICAL ANALYSIS

- independent and interactive effects of smoking and occupational exposures, 162–164
- interactions between occupational exposures and smoking, 104, 109–113
- occupational exposure effect on disease risk, confounding by smoking, 114–123
- occupational exposures and smoking, quantifying interactive effects, 158
- occupational exposures, confounding of risk by smoking, use of comparison groups, 122–130
- occupational risks, comparability of internal and external control groups, 166

THIOCYANATES

- serum level measurement to document smoking status in workplace studies, 161

TOBACCO SMOKE

- aromatic amines, possible role in carcinogenesis, 371–372
- environmental levels as risk factor in nonsmokers, 199–200

TUBERCULOSIS

- (*See also* OCCUPATIONAL DISEASES)
- mortality in silica-exposed workers, 327
- silica-induced, smoking role, 325
- workers exposed to "pure" silica, standard mortality ratios, 345

Tumorigenesis *See* CARCINOGENESIS

Tumors *See* CANCER

URANIUM

- (*See also* OCCUPATIONAL EXPOSURES; RADIATION; SILICA)
- dust, carcinogenic effects in dogs, 458
- lung cancer in miners, exposure and smoking risks, 446–452
- miners, smoking habits, 448
- pulmonary effects of exposures, with smoking, 463–464

WOMEN

- lung cancer risks, 377

INDEX

Workplace *See* OCCUPATIONAL GROUPS; OCCUPATIONS

WORKPLACE EXPOSURE STUDIES

(*See also* RESEARCH RECOMMENDATIONS)

asbestos, establishing risk threshold, smoking as factor, 224-225
 asbestos-related mortality, data by type of exposure, 206-209
 cancer mortality relationship, smoking status as source of confounding, 114-122
 case-control analyses to control confounding by smoking, 129-130
 chest x ray abnormalities in workers, smoking effect, 154-155
 chronic lung disease in occupationally exposed workers, 142-148
 confounding by smoking behavior, sources and control, 114-130
 control of potential confounding by smoking, use of comparison groups, 123
 cotton workers, respiratory system effects, with smoking, 403-431
 duration and concentration of exposure, determination methods, 162
 external control populations, comparability with exposed group, 165
 healthy worker effect in cross-sectional design, smoking role, 164
 healthy worker effect on mortality risk evaluation, 128
 high-risk populations, need for data on smoking intervention efficacy, 498-500
 internal controls, comparable smoking status to control confounding, 129
 lung disease risk, with smoking, summary and conclusions, 169-170
 mortality risk, adjustments when smoking habits not known, 130-131
 occupation and smoking risks, use of external vs. internal controls, 123-130
 occupational lung disease and cigarette smoking, prevalence in survey populations, 147

WORKPLACE EXPOSURE STUDIES—Contd.

physiological assessment of workers, independent effects of smoking, 156
 quantification of relative risk in individuals, 167
 quantifying effects in populations, concepts of smoking interactions, 158-160
 quantifying occupational and smoking risks, 160-168
 questionnaire to establish smoking status recommended, 161
 relative risk of cancer, smoking status as source of confounding, 115-122
 silica, prospective study data on exposed workers, 337-338
 silica, research recommendations on health effects, with other exposures and smoking, 347-348
 statistical analysis of independent and interactive effects of smoking, 162-164

WORKPLACE INTERVENTION PROGRAMS

(*See also* RESEARCH RECOMMENDATIONS; SMOKING CONTROL PROGRAMS)

asbestos workers, efficacy for smoking reduction/cessation, 499-500
 controlled, characteristics, 483, 489-490
 controlled studies, data by worksite type, procedural characteristics, 484-485
 design and outcome data from controlled smoking modification studies, 486-488
 evaluation criteria, 479-480
 general results and research needs, 17-18
 high-risk populations, large-scale studies needed, 498-500
 implementation, 504-506
 methodological deficiencies in comparison conditions, participation rates, 491
 methodological issues in program design, evaluation criteria, 507-508
 monetary incentives and competition, efficacy, 495-498

INDEX

WORKPLACE INTERVENTION

PROGRAMS—Contd.

- multiple risk factor intervention programs, efficacy for smoking cessation, 490
- organizational characteristics, other factors in program success, 502–504
- overview of smoking control programs, advantages vs. disadvantages, 477–479
- participant characteristics, program intensity, worksite size, outcome effects, 489–490
- physician's advice, efficacy, 493–495
- program characteristics, advantages/disadvantages of various approaches, 505–506
- recommendations for future research, 507–509
- research needed on variables that affect program success, 504
- review, uncontrolled vs. controlled studies, 481–483, 489–490
- social support for nonsmoking, relevancy in worksite programs, 491–493
- summary and conclusions, 509
- uncontrolled, without objective measures of smoking status, cessation rates, 482

WORKPLACE SMOKING

(*See also* SMOKING; SMOKING HABIT; SMOKING PREVALENCE)

- asbestos workers, multiplicative interactive effects, 9
- biological, statistical, and public health interactions with occupational exposures, 104–113
- cotton workers, disease risks, 16–17
- lung disease risk, independent and interactive effects with occupational exposures, 142
- occupational categories, by age and sex, 83–96
- occupational environment as factor in initiation, 32
- occupational exposure studies, potential for confounding, 114–130
- occupationally exposed workers, control groups to reduce potential confounding effect, 123
- recent changes by occupation, age, and sex, 33–38
- workers exposed to respiratory hazards, lung disease risk, 146–150

WORKSITE *See* OCCUPATIONAL GROUPS; OCCUPATIONS